*8.3/IIASA Working Conference on Processes and Tools for Decision Support*, H.G. Sol, ed. (1983)).

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## Epistomological Aspects of Knowledge-Based Decision Support Systems

*by Ronald M. Lee*

Knowledge-based decision support applications differ from those typical of artificial intelligence expert systems in their open-ended, evolutionary character and need to coordinate with other systems resources, such as organizational databases and quantitative analysis routines. While knowledge representation machinery is becoming available, the corresponding formalization of managerial/administrative knowledge needed for DSS application is still lacking.

This entails problems of an epistomological nature, identifying the foundational concepts of business. An abstract framework based on formal languages and denotational semantics is proposed, and ontological issues are identified (*Proceedings of the Joint IFIP WG 8.3/IIASA Working Conference on Processes and Tools for Decision Support*, H.G. Sol, ed. (1983)).

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## A Non-Developmental MIS Strategy for Small Organizations

*by Michael A. Kole*

Successful implementation is necessary for management information systems to be effective. This article discusses how successful implementation may be achieved in smaller organizations with limited resources. The characteristics and allegiances of the implementor are shown to be a key to the management of this change process. A consultive strategy is proposed which focuses on the implementation of a standardized MIS rather than the development of unique systems. The strategy develops profiles of the implementor and user roles. It emphasizes the importance of the implementation process in achieving an effective and efficient installation.

Field studies in three firms are presented to discuss the strategy. One firm stopped increases in administrative costs and achieved rapid implementation by following the proposed strategy. A second firm followed part of the strategy and produced less dramatic results. The third firm relied on internal resources for development and implementation and showed the least impressive results (*Systems, Objectives, Solutions* 3 (1983)).

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## The Politics of Modeling: Computer Models in the Policy Process

*by William H. Dutton and Kenneth L. Kraemer*

This paper develops and examines four perspectives on the politics of modeling. These are labeled the rational, technocratic, partisan, and consensual perspectives on modeling. As ideal types, these perspectives capture major debates concerning who controls the modeling process and whose interests are served by the process. Each perspective is assessed in the light of empirical research on the implementation of computer-based fiscal impact models in American local governments. This field research on fiscal impact models supports the utility of a consensual perspective on the politics of modeling which views models primarily as tools for negotiation, bargaining, and interactive decision making among the representatives of conflicting interests in the policy process (*Systems, Objectives, Solutions* 3 (1983)).

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## Logical Foundation Approach to Users' Domain Restriction in Data Bases

*by Andrzej Jankowski and Cecylia Rauszer*

The paper deals with the mathematical description of systems with a limited access to a data base. The domain of the data base to which a given user has the access is identified with the position of the user in some hierarchy. The natural order (area inclusion) corresponds then to the position in the above mentioned hierarchy. In this way – a little unformally – the base area to which the user is given an access might be called his priority. Since the language of the information system is the same for all users, the difference in their priorities consists in that the same query could be given a different answer which depends both on the query and on the user priority. The language with which the system is operated indicated the access to various base areas. Intermediate logics with logical constants (which correspond to the priorities) are used to its description. The principles for operating this language are described as well as a complete semantics is formulated (*Theoretical Computer Science* 23, 1 (1983)).

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## A Metatheorem for Undecidable Properties of Formal Languages and Its Application to LRR and LLR Grammars and Languages

*by Stephan Heilbrunner*

A metatheorem will be proven for decision problems which can be represented by pairs of simple grammars. Examples are given in support of the claim that the metatheorem has a wide range of applications. Especially, some relative decision problems concerning LR($k$), LL-regular, and LR-regular grammars and languages are resolved. In addition, iteration theorems are derived which allow the proof that certain languages are not LL-regular or LR-regular (*Theoretical Computer Science* 23, 1 (1983)).

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## A Direct Branching Algorithm for Checking Equivalence of Strict Deterministic vs. LL($k$) Grammars

*by Etsuji Tomita*

We present here an equivalence checking algorithm which operates directly on a pair of strict deterministic vs. LL($k$) grammars. It is also straight forwardly applicable to a pair of LL($k$) grammars, though an LL($k$) grammar is not necessarily strict deterministic. The basic idea is from Korenjak and Hopcroft's branching algorithm for simple deterministic grammars, but ours is so distinguished that it is throughout free from mixing the nonterminals of the respective grammars in question and then very simple (*Theoretical Computer Science* 23, 2 (1983)).

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## Fundamental Properties of Infinite Trees

*by Bruno Courcelle*

Infinite trees naturally arise in the formalization and the study of the semantics of programming languages. This paper investigates some of their combinatorial and algebraic properties that are especially relevant to semantics.

This paper is concerned in particular with regular and algebraic infinite trees, *not* with regular or algebraic *sets* of infinite trees. For this reason most of the properties stated in this work become trivial when restricted either to finite trees or to infinite words.

It presents a synthesis of various aspects of infinite trees, investigated by different authors in different contexts and hopes to be a first step towards a theory of infinite trees that could take place near the theory of formal languages and the combinatorics of the